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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 7155-1 (1986): Code of recommended practice for conveyor safety, Part 1: General information [MED 6: Continuous Bulk Conveying, Elevating, Hoisting Aerial Ropeways and Related Equipment]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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*Indian Standard***CODE OF RECOMMENDED PRACTICE FOR
CONVEYOR SAFETY****PART 1 GENERAL INFORMATION***(First Revision)*

1. Scope — Covers general information regarding the recommended practice to be adopted in the safe use of conveyors and conveying machinery used for transportation of bulk materials or unit loads.

1.1 The conveyors covered in this standard may be of temporary or permanent nature.

1.2 This code does not apply to industrial trucks, tractors or trailers, tying machines, cranes, hoists, skip hoists, monorails, power and hand shovels, power scoops, bucket drag lines, platform elevators designed to carry passengers or the elevator operator, moving stairways and highway or rail vehicles, or conveyors specifically designed for the conveyors of passengers.

2. Terminology

2.1 For the purpose of this code, the following definitions, in addition to those given in IS : 4240-1984 'Glossary of conveyor terms and definitions (*first revision*)' shall apply.

2.2 Conveyor System — An installation of two or more conveyors which transport or transfer loads from one conveyor to another and whose control is integrated.

2.3 Normal Working Conditions — Specified conditions as agreed by the interested parties for the use of continuous mechanical handling equipment.

2.3.1 These normal working conditions shall either be defined by the user and agreed with the manufacturer at the time of passing the order, or defined for standard equipment in the manufacturer's catalogue when it is issued.

2.4 Personnel — Persons essential to the use (the operation) of the continuous mechanical handling equipment itself and persons legitimately in the vicinity.

3. Materials

3.1 Unless otherwise specified all materials used in the construction and operation of a conveyor and its supporting structure shall comply with the requirements of relevant Indian Standards where available. A list of such Indian Standards for guidance is given in Appendix A. Materials equivalent to or superior to those specified may be used subject to agreement between the manufacturer and the user.

4. General Information

4.1 Stages — The safety requirements of the conveyors of various types may be divide into three stages as follows:

- a) Construction stage (design and manufacture),
- b) Installation stage (layout, erection and entry into service); and
- c) Utilization stage (operation and maintenance).

4.1.1 The safety requirements during construction stage shall be those to be taken care of during the design and manufacture of the conveyor system, equipments and machinery.

4.1.2 The safety requirements during installation stage shall be those to be taken care of during layout, erection and entry into service of the conveyor system, equipments and machinery.

4.1.3 The safety requirements during utilization stage shall be those to be taken care of during operation and maintenance of the conveyor systems, equipments and machinery.

Adopted 17 December 1986

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4.2 Lighting — Suitable lighting of conveyor systems, equipments and machinery shall be provided. For guidance recommendations of IS : 3646 'Code of practice for interior illumination' in following parts may be referred:

- (Part 1)-1966 Principles of good lighting and aspects of design
- (Part 2)-1966 Schedule for values of illumination and glare index
- (Part 3)-1968 Calculation of coefficients of utilization by the BZ method

4.2.1 Permanent lighting shall be installed in tunnels and pits with a switch located convenient to the entrance(s).

4.2.2 Electric outlets for handlamps shall be provided at convenient locations.

4.2.3 The lamps/lights shall be cleaned regularly.

4.3 Electrical Equipment — Electrical equipment shall be installed and maintained to meet the statutory requirements. For guidance following Indian Standards may be referred:

- a) IS : 732 Code of practice for electrical wiring installations:
 - IS : 732 (Part 1)-1982 Definitions and general requirements (*second revision*);
 - IS : 732 (Part 2)-1983 Design and construction (*second revision*); and
 - IS : 732 (Part 3)-1982 Inspection and testing of installations (*second revision*).
- b) IS : 4051-1967 Code of practice for installation and maintenance of electrical equipment in mines;
- c) IS : 5571-1979 Guide for selection of electrical equipment for hazardous areas (*first revision*);
- d) IS : 5572 (Part 1)-1978 Classification of hazardous areas (other than mines) for electrical installations : Part 1 Areas having flammable gases and vapours (*first revision*); and
- e) IS : 8239-1976 Classification of maximum surface temperatures of electrical equipment for use in explosive atmospheres.

4.4 Fire Protection — Adequate fire protection facilities shall be provided and shall be to the approval of the statutory authority. For guidance following Indian Standards may be referred:

- a) IS : 1641-1960 Code of practice for fire safety of buildings (general): General principles and fire grading
- b) IS : 1642-1960 Code of practice for fire safety of buildings (general) : Materials and details of construction
- c) IS : 1643-1960 Code of practice for fire safety of buildings (general) : Exposure hazard
- d) IS : 1644-1960 Code of practice for fire safety of buildings (general) : Personal hazard
- e) IS : 3034-1981 Code of practice for fire safety of industrial buildings : Electrical generating and distributing stations (*first revision*)

4.5 Dust and Fumes — Where dust or fumes may become a hazard, means shall be taken to prevent injury to persons. The design of the system shall be such as to prevent or control the emission of dust and fumes.

4.6 Static Charge/Electricity — It is known that continuous rotation and friction of non-metallic components in a conveyor system produces a lot of static electricity. For normal run-off mine handling plants for coal, iron, limestone, etc, the accumulated static charge may not pose much of a problem. However, for special application of conveyors, which carry explosive dusts and compounds, limiting the accumulated static charge/electricity in a conveying system is extremely important.

4.6.1 Where accumulated static charge/electricity is considered important, the limit of such a charge shall be as agreed to between the user and the manufacturer.

4.7 List of Indian Standards on conveyors, vertical hoists, bulk elevators and bulk handling equipment is given in Appendix B for information.

APPENDIX A

(Clause 3.1)

INDIAN STANDARD SPECIFICATIONS ON MATERIALS**A-1. Structural Steel**

- IS : 226-1975 Specification for structural steel (standard quality) (*fifth revision*)
 IS : 808-1964 Specification for rolled steel beam, channel and angle sections (*revised*)
 IS : 811-1965 Specification for cold formed light gauge structural steel sections (*revised*)
 IS : 961-1975 Specification for structural steel (high tensile) (*second revision*)
 IS : 1161-1979 Specification for steel tubes for structural purposes (*third revision*)
 IS : 1239 Specification for mild steel tubes, tubulars and other wrought steel fittings :
 (Part 1)-1979 Part 1 Mild steel tubes (*fourth revision*)
 IS : 1239 Specification for mild steel tubes, tubulars and other wrought steel fittings :
 (Part 2)-1982 Part 2 Mild steel tubulars and other wrought steel pipe fittings (*third revision*)
 IS : 1252-1958 Specification for rolled steel sections bulb angle
 IS : 2062-1984 Specification for weldable structural steel (*third revision*)
 IS : 3039-1980 Specification for structural steels for construction of hulls of ships (*first revision*)
 IS : 3443-1980 Specification for crane rail sections (*first revision*)
 IS : 3601-1984 Specification for steel tubes for mechanical and general engineering purposes
 (*first revision*)
 IS : 3954-1966 Specification for hot rolled steel channel sections for general engineering
 purposes
 IS : 4923-1985 Specification for hollow steel sections for structural use (*first revision*)

A-2. Forgings and Castings

- IS : 210-1978 Specification for grey iron castings (*third revision*)
 IS : 1030-1982 Specification for carbon steel castings for general engineering purposes
 (*third revision*)
 IS : 1865-1974 Specification for iron castings with spheroidal or nodular graphite (*second revision*)
 IS : 2004-1978 Specification for carbon steel forgings for general engineering purposes (*second revision*)
 IS : 2107-1977 Specification for whiteheart malleable iron castings (*first revision*)
 IS : 4367-1967 Specification for alloy and tool steel forgings for general industrial use
 IS : 4771-1985 Specification for abrasion-resistant iron castings (*second revision*)
 IS : 4896-1976 Specification for one-percent chromium steel castings for resistance to abrasion
 (*first revision*)

A-3. Rivets

- IS : 1929-1982 Specification for hot forged steel rivets for hot closing (12 to 36 mm diameter)
 (*first revision*)
 IS : 2998-1982 Specification for cold forged steel rivets for cold closing (1 to 16 mm diameter)
 (*first revision*)

A-4. Bolts

- IS : 1363 Specification for hexagon head bolts, screws and nuts of product grade C:
 (Part 1)-1984 Hexagon head bolts (size range M 5 to M 36) (*second revision*)
 (Part 2)-1984 Hexagon head screws (size range M 5 to M 36) (*second revision*)
 (Part 3)-1984 Hexagon nuts (size range M 5 to M 36) (*second revision*)
 IS : 1364 Specification for hexagon head bolts, screws and nuts of product grades A and B:
 (Part 1)-1983 Hexagon head bolts (size range M 3 to M 36) (*second revision*)
 (Part 2)-1983 Hexagon screws (size range M 3 to M 36) (*second revision*)
 IS : 2585-1968 Specification for black square bolts and nuts (diameter range 6 to 39 mm)
 black square screws (diameter range 6 to 24 mm) (*first revision*)
 IS : 3138-1966 Specification for hexagonal bolts and nuts (M42 to M150)

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A-5. Conveyor Belts

- IS : 1891 Rubber conveyor and elevator textile belting:
(Part 1)-1988 General purpose belting (*third revision*)
(Part 2)-1988 Heat-resistant belting (*second revision*)
(Part 3)-1988 Oil-resistant belting (*second revision*)
(Part 4)-1978 Hygienic belting
IS : 3181-1978 Specification for fire resistant conveyor belting for underground use in coal mines (*first revision*)

A-6. Chain

- IS : 2403-1975 Specification for transmission steel roller chains and chain wheels (*first revision*)
IS : 3542-1980 Specification for extended pitch transmission precision roller chains and chain wheels (*first revision*)
IS : 3560-1980 Specification for short pitch transmission precision bush chains and chain wheels (*first revision*)
IS : 3948-1986 Specification for calibrated high tensile steel (round link) chain (electric butt welded) for chain conveyors and coal ploughs used in mines (*first revision*)
IS : 6834 Specification for conveyor chains, chain-wheels and attachments
(Part 1)-1973 Chains
(Part 2)-1976 Chain-wheels
(Part 3)-1976 Attachments

A-7. Gears

- IS : 2535-1978 Specification for basic rack and modules of cylindrical gears for general engineering and heavy engineering (*second revision*)
IS : 3734-1983 Dimensions for worm gearing (*first revision*)
IS : 5037-1969 Specification for basic rack and modules of straight bevel gears for general engineering and heavy engineering

A-8. Wire Ropes

- IS : 1856-1977 Specification for steel wire ropes for haulage purposes (*second revision*)
IS : 2266-1978 Specification for steel wire ropes for general engineering purposes (*second revision*)

A-9. Concrete

- IS : 456-1978 Code of practice for plain and reinforced concrete (*third revision*)

Note — Updated information shall be available in the latest available BIS Handbook.

APPENDIX B

(Clause 4.7)

INDIAN STANDARDS ON CONVEYORS, HOISTS AND RELATED MATERIAL HANDLING EQUIPMENT

- IS : 3938-1983 Specification for electric wire rope hoists (*second revision*)
IS : 4240-1984 Glossary of conveyor terms and definitions (*first revision*)
IS : 4776 Specification for troughed belt conveyors:
(Part 1)-1977 Surface installation (*first revision*)
(Part 2)-1977 Troughed belt conveyors for underground installation
IS : 5228-1969 Code of practice for construction of continuous movement monocable ropeways with fixed grips intended for transportation of passengers
IS : 5229-1969 Code of practice for construction of continuous movement monocable ropeways with automatic grips intended for transportation of passengers

IS : 5230-1969	Code of practice for construction of continuous to-and-fro movement bicable ropeways intended for transportation of passengers
IS : 5563-1985	Specification for screw conveyors for industrial use (<i>first revision</i>)
IS : 5895-1985	Specification for steel roller conveyors (<i>first revision</i>)
IS : 5972-1970	Glossary of pneumatic and hydraulic conveying terms and definitions
IS : 6832-1985	Specification for fixing screws and fixing washers for buckets for bucket elevators (<i>first revision</i>)
IS : 6833-1973	Specification for bucket elevators
IS : 6930-1973	Dimensions for fixing arrangements of buckets for bucket elevators
IS : 7054-1973	Specification for casing for bucket elevators
IS : 7167-1974	Code for selection and use of bucket elevators
IS : 7423-1974	Dimensions for apron conveyors
IS : 7439-1974	Dimensions for aeroslides
IS : 7465-1974	Specification for portable and mobile troughed belt conveyors
IS : 7649-1975	Glossary of terms used in connection with aerial ropeways and cableways
IS : 8531-1986	Specification for pulleys for belt conveyors (<i>first revision</i>)
IS : 8597-1977	Specification for flat belt conveyors
IS : 8598-1977	Specification for idlers and idler sets for belt conveyors
IS : 8599-1977	Recommendations for selection of apron conveyors
IS : 8646-1977	Specification for scraper (flight) conveyors
IS : 8647-1977	Specification for design criteria for pneumatic conveying systems
IS : 8723-1978	Dimensions for vibrating conveyors and feeders with rectangular or trapezoidal trough
IS : 8730-1978	Classification of bulk materials handled by continuous mechanical handling equipment
IS : 9047	Specification for data sheet for aerial ropeways and cableways:
(Part 1)-1978	Data to be supplied by intending purchaser for aerial system for transportation of goods
(Part 2)-1980	Data to be supplied by intending purchaser for aerial system for transportation of passengers, surface
(Part 3)-1983	Data to be supplied by intending purchaser for aerial system for transportation of passengers, under ground
(Part 4)-1983	Data to be supplied by intending purchaser for aerial system for transportation of goods, under ground
(Part 6)-1980	Data to be supplied by intending purchaser for aerial system for transportation of forestry products
IS : 9228-1979	Specification for mono seat chairs for chairlifts used in winter sports
IS : 9413-1980	Specification for rope guide rollers for haulage ropes for bicable aerial ropeways for transportation of goods
IS : 9454-1980	Specification for bicable load carriers
IS : 9706-1980	Code of practice for the construction of aerial ropeways for the transportation of material
IS : 9776-1981	Specification for data sheet for selection of weighing-cum-tipping/bag filling machines for bulk handling
IS : 9777-1981	Specification for data sheet for weigh bridges for bulk handling equipment
IS : 10095-1982	Guidelines for selection of tipplers for broad gauge open railway wagons
IS : 10280-1982	Guidelines for format and contents of manuals for earth moving equipment
IS : 10303-1982	Code of practice for preservation and storage of earth moving equipment
IS : 10443-1983	Specification for data sheet for selection of marine loading arms
IS : 10463	Glossary of terms for bulk handling equipment:
(Part 2)-1985	Stacking, loading and reclaiming equipment
(Part 6)-1983	Cyclic loose bulk handling equipment (non-stationary)
IS : 10464-1983	Specification for data sheet for selection of wagon puller/pusher
IS : 10678-1983	Specification for data sheet for design/selection of vacuum producer
IS : 10689-1983	Specification for minimum dimensions for access openings on earth-moving machinery
IS : 10704-1983	Guidelines for design of access systems for earthmoving machinery
IS : 10856-1984	Specification for volumetric rating of elevating scrapers
IS : 10859-1984	Specification for volumetric rating of dumper bodies

Note — Updated information about these Indian Standards shall be available in the latest issue of the BIS Handbook.

EXPLANATORY NOTE

IS : 7155 as a code of practice for conveyor safety was published in 1974. Based on the experience gained in the field and revision of related International Standards as also the availability of some other related ISO standards, this revision has been taken up.

This Part 1 of the standard is one of the series of Indian Standards on code of recommended practice for conveyor safety. The other parts of the standard are:

Part 2 General safety requirements, and

Part 3 Belt conveyors and feeders.

This Part 1 of the standard is a necessary adjunct to other parts of the standard.

In the preparation of this standard considerable assistance has been derived from the following publications:

ISO 1819-1977 'Continuous mechanical handling equipment — Safety code — General rules' issued by the International Organization for Standardization (ISO);

ISO 7149-1982 'Continuous handling equipment — Safety code — Special rules' issued by the International Organization for Standardization ISO, and

AS CZ 15-1971 SAA 'Conveyor safety code' issued by Standards Association of Australia.